

# **MICRONEEDLE DEVICE FOR TRANSPORT OF MOLECULES ACROSS TISSUE**

## **Abstract of the Disclosure**

Microneedle devices for transport of therapeutic and diagnostic materials and/or energy across tissue barriers, and methods for manufacturing the devices, are provided. The microneedles are hollow and/or porous and have diameters between about 10 nm and 1 mm. The microneedle devices permit drug delivery (or removal or sensing of body fluids) at clinically relevant rates across skin or other tissue barriers, without damage, pain, or irritation to the tissue. Microfabrication techniques are used to cost-effectively produce arrays of microneedles from metals, silicon, silicon dioxide, ceramic, and polymeric materials. Methods are provided for making porous or hollow microneedles.